

## INSTITUTE DATA

### **FORUM PARTICIPANT**

Nobuo Jiromaru,  
General Director

### **INSTITUTE NAME**

National Research Institute of Fire and Disaster  
(former name: Fire Research Institute)

### **INSTITUTE AFFILIATIONS**

Fire and Disaster Management Agency  
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### **ENTRY DATE**

August 1996

### **STAFF NUMBERS**

50

### **FUNDING**

779 million yen (US\$7M) in FY1995

## CAPABILITY STATEMENT

### **STRATEGIC OBJECTIVES OF RESEARCH**

- To protect human life and property from fires and other disasters.
- To dedicate to the development of technology for the fire service.
- To support the investigation of relevant social needs and fire service administration.

### **CAPABILITY AREAS**

- Fundamental research on fire combustion and fire extinguishing
- Extinguishing art of oil fire and plastic fire
- Fire alarm system, extinguishing equipment and system for fire prevention
- Resources and equipment utilized in fire fighting such as fire pump, ladder fire engine and fire proof clothing
- Appropriate techniques to combat smoke and flames
- Evacuation procedures for fire and earthquake emergencies
- Life saving techniques for rescuing people trapped in collapsed buildings
- Research into the fire hazard risk associated with all kinds of combustible and hazardous articles
- Leakage prevention technology applicable to tanks and plant where hazardous materials are handled

### **SPECIAL FACILITIES**

#### Testing Facility for Large-scale Fire

- Fire test facility (24x24x20m(H)) with attached smoke removal and treatment installation (in which oil tank fire up to 3m and timber fire up to the heat generation rate of 21MW are available)

#### Fire Extinguishing Research Building

- Large-scale fire test facility (25x25x20m(H)) with attached smoke removal (90,000m<sup>3</sup>/h) and an air blower (450,000m<sup>3</sup>/h)
- Small-scale fire test facility (14.4x14.4x12m(H)) with sprinkler system

#### Residential Fire Research Building

- Sprinkler test facility for residential building
- Facility for residential fire alarm test
- Fire test facility with room calorimeter
- Radio wave anechoic chamber to test electro magnetic interference with workings of fire protection equipments
- Testing facility of residential rooms with smoke control system

#### Material Safety Research Building

- Explosion test facility
- Low temperature test facility for hazardous materials
- Test facility for electro-static phenomena
- Combustion testing facility
- Test facility for fire-resistive materials

#### Hydraulic Power and Machinery Research Building

- Hydraulic power test facility
- Low temperature test facility for water supply system

## RESEARCH PROGRAM

### ***RESEARCH PROJECTS (Titles and Objectives)***

- Fire in Structures
- Fire-Preventive System of Cultural Property Buildings
- Characteristics of Fire Phenomena in Underground Facilities
- Protection Measures of Post-earthquake Fire Damage to residential Structures
- Simulation of Fire in Tunnel
- Fire Detection and Extinguishment of Residential Fire
- Fire Fighting and Fire Equipments
  - Development of Handrail Climbing Robot for Fire Fighting in High-rise Apartment Building
  - Improvement of Portable Transceiver for Firefighters
  - Development of a Long Away Relay Pumping System by Various Types of Pumps
  - Air Attack of Forest Fire Utilizing Sea Water
  - Interference of Sound Wave Broadcasted from Outdoor Speaker System for Public Address
  - Evaluation Method of Performance of Pippings and Fittings for Fire-Extinguish Apparatus
- Hazardous Material
  - Testing Methods for the Risk Evaluation of Flammable Substances and Self-reactive Substances
  - Deformation Behavior of Oil Storage Tank subjecting to Earthquake Motion and It's Low-cycle Fatigue Strength
  - Characteristics of Broad-band Input Ground Motion to Oil Storage Tanks
- Extinguishment and Fire Protection Equipment
  - Development of Prevention Techniques against Large Spreading Fires using Minimum Volume of Water
  - Improvement and Evaluation of Fire Extinguishing Efficiency by Complex Use of Fire Suppressants
- Earthquake Disaster
  - Fire-preventive Measures of Temporary Evacuation Centers after a Great Earthquake
  - Methods for Collecting and Processing Disaster Information in Post-Earthquake Countermeasures of Municipalities
  - System for Rapid Collection of Earthquake Damage Information
- Miscellaneous
  - Flammability of Flame Retardant Materials by using Cone Calorimeter
  - Fundamental Study on Material and Energy Generation at the Early Fire Stage
  - Effect of Electromagnetic Waves on Electronic Devices of Fire Equipment
  - Breackdown of Solid Insulator Caused by Accumulated Charge on the Surface

## COLLABORATION

### INTERNATIONAL LINKS

- Computer simulation of fire process with State Key Laboratory of Fire Science, University of Science and Technology of China,
- Computer simulation of tunnel fire with Health and Safety Laboratory, UK
- Halon replacements with NIST

### POTENTIAL COLLABORATION THROUGH FORUM

- Model validation
- Smoke movement and control in underground space

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## **RECENT PUBLICATIONS**

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